

*Naval Aviation Systems*  
***TEAM***



**“Naval Aviation  
Maintenance Information  
Systems Web Enablement  
Plan”**

Presented to the RfC

***AIR-3.6***

***9 May 01***



# ***Background***

- ★ **Joint Program migration to NAVAIR**
- ★ **Naval Aviation Programs Migration**
- ★ **Data Collection Goals Focus / AMSR**
  - **Reduce multiple Databases**
  - **Make easier, less costly to update**
    - ↳ **User Interfaces**
    - ↳ **Applications**
    - ↳ **Data**
  - **Enable Business Process Efforts**
  - **Eliminate unnecessary Complexity**
  - **Implement Common 'Look & Feel'**



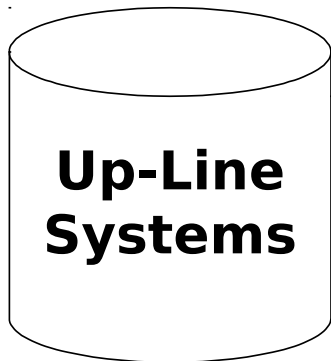
# ***Logistics Process Requirements***



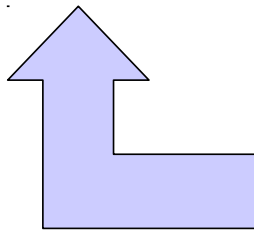
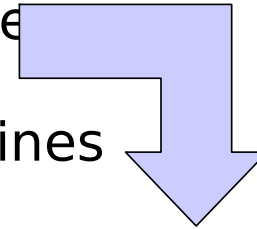
- **Acquisition community**
  - Integrated Logistics Support elements including In-Service Support
  - Configuration Management and Baseline Management
- **Levels of Maintenance**
  - Performance, cost, readiness
  - License plate information, custody
  - Life-limit meters, maintenance history
- **Emerging requirement for ELVIS (Enterprise Level Visibility [of assets])**



# ***Two-Way Aviation Maintenance Data Flow***



- Allowable Configuration
- Maintenance Baseline
- Technical Directives
- Technical Data Baselines and Changes



- Readiness
- Location
- Custody
- Life-Usage
- Condition
- Cost
- Maintenance History
- Serial No. Tracking
- As-Is Configuration
- System Deficiency Reports





# ***Naval Aviation Logistics Information Systems Functional Areas***



- **Reliability/Maintainability/Utilization**
  - ECA, IMA, FOJ, LMDSS, AV-3M, WUCMIS
- **Configuration Management**
  - CMIS, COMTRAK, ATCM, PLTS, TDSA, KITMIS, MODMIS
- **End-Item Ownership**
  - AEMS, AIRRS, AWIS, MEASURE, LMDSS
- **Cost / Affordable Readiness**
  - LMDSS, ARTS
- **Readiness**
  - AV3M, LMDSS, AIRRS, FOJ
- **Process Support**
  - JCALS WFM & JTM



# ***Data Administration Initiatives***

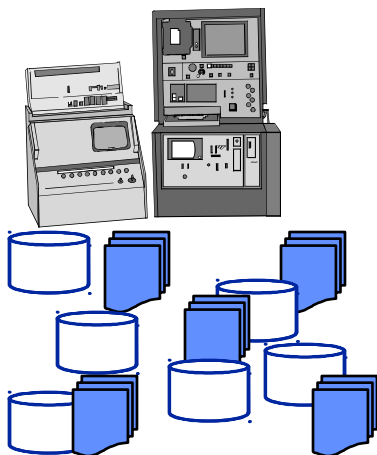


- **Utilizing the Data Acquisition & Reconciliation Tool (DART)**
  - Provides standard format for data elements and metadata
  - Supports the data mapping process
  - Assists in identifying and documenting Authoritative Data Sources
  - Critical to system integration and interface design
  - Prepares and enables registration in the DMIR
- **FY01 status**
  - 5 Production databases imported
  - 8 remaining for FY01
  - 1 system registered in DMIP



# Integration / Migration Strategy

## Mainframe Environment

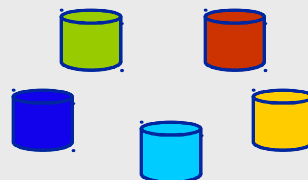


**200+ Systems**

- ◆ Data Unique
- ◆ Mostly COBOL
- ◆ Flat file & Hierarchical

**Data Bases**

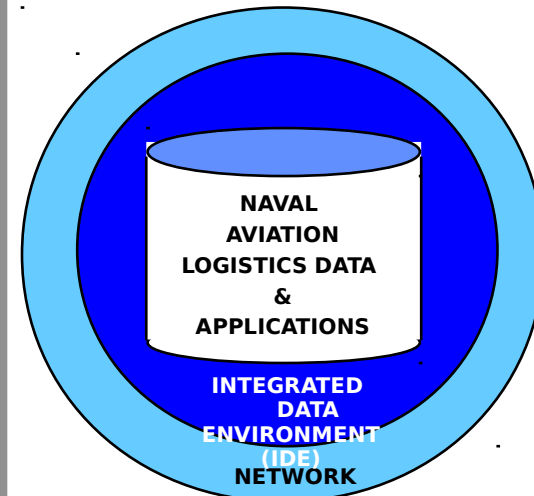
## Consolidated Environment



**<100 Systems**

- ◆ Data Redundancies Reduced
- ◆ Functional Integration
- ◆ Relational Data Bases
- ◆ Client / Server

## Integrated Data Environment

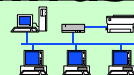


- ◆ Data Rich
- ◆ Web Based
- ◆ Protected Access
- ◆ GCSS Compliant

## Infrastructure



**Mail, Microfiche, Dial-up**



**LAN/WAN, WWW**



**DII COE, IT-21, GBS, N/MCI, ERP**

1975

1999

2002



# ***Joint Vision 2020***



- Focused Logistics
  - Right personnel, equipment, and supplies at the right place, right time, in the right quantity
  - Enabled by real-time, web-based information system
  - Providing Total Asset Visibility
  - Linking Operator and Logistician across Services and support agencies





# ***Elements of GCSS Information Fusion***



<b>Element</b>	<b>Definition</b>
Any box	Benefit of a Common Operating Environment (COE) to overcome the incompatibility of different operating systems
Any user	Benefit of using common screens on any workstation to reduce training
One net	Ultimate availability of all warfighter functions from a single workstation
One picture	Capability to integrate information across functional areas, combat support, and command and control
Common services	Basic computing services, such as printer, sound, and communication interfaces within the COE
Robust communications infrastructure	All networks, pipelines, and hardware necessary to provide global, near real-time access to information



# ***Other JV 2020 Enablers***

- GCSS will provide common infrastructure, the first enabler.
- Others include:
  - Automated Information Technology (AIT)
  - Total Asset Visibility (TAV)
  - In-Transit Visibility (ITV)
  - Decision Support Tools
    - **“We must focus on ‘Actionable Information’ ”**
    - *Honorable Roger W. Kallock*  
*Deputy Undersecretary of Defense, Logistics*

(DOD Logistics Community Conference Annapolis, MD, August, 2000)



# ***Naval Aviation Logistics IS Initiatives***



- Automated Maintenance Environment (AME)
- Naval Aviation Logistics Command Management Information System (NALCOMIS)
- Naval Aviation Logistics Data Analysis (NALDA) Integrated Data Environment (IDE)
- Post-Fielding Support Analysis (PFSA)
- Configuration Management Information System (CMIS)
- Joint Aviation Technical Data Integration (JATDI)
- Joint Engineering Data Mgmt Info & Control Sys (JEDMICS)
- Enterprise Resource Planning (ERP) Pilots
  - NAVSUP/NAVAIR: Aviation Supply Chain Management/Maintenance Management (SMART)
  - NAVAIR: Program Management (SIGMA)
  - CLF/NAVSEA: Regional Maintenance (NETS)



# Information Fusion Capability Matrix

NAVAL AVIATION SYSTEMS



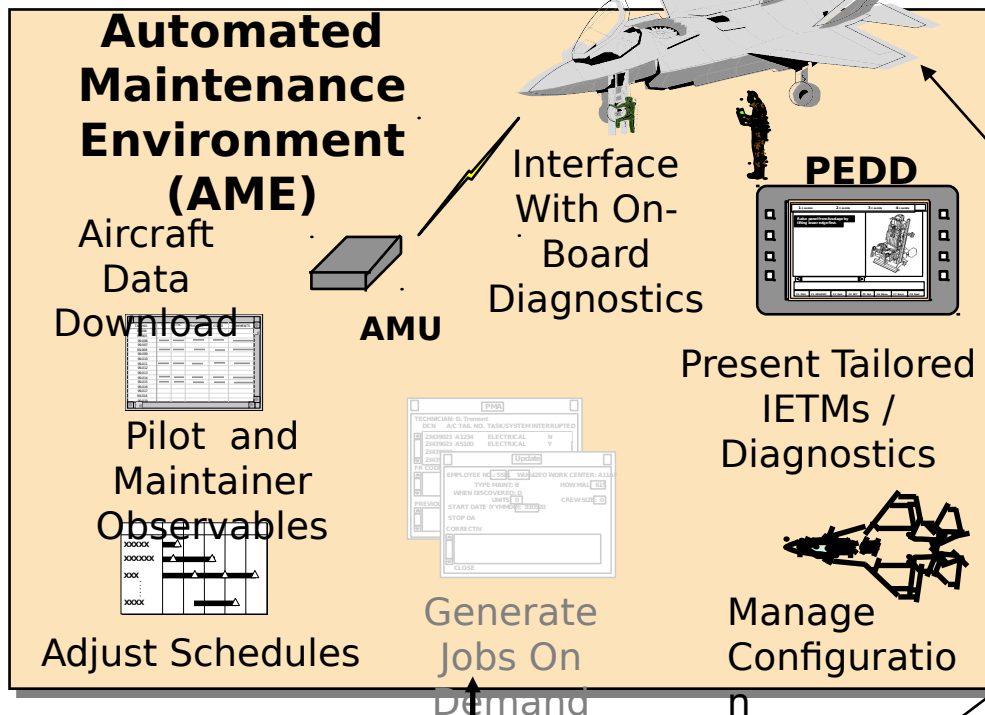
	Infra-structure	AIT	Total Asset Visibility	In-Transit Visibility	Tools
AME		X	X		
NALCOMIS OOMA	X	X	X		
NALDA IDE	X				X
PFSA	X				X
CMIS	X		X		
JATDI	X				X
JEDMICS	X				X
<b>DoN ERP Pilots</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>



# AME / AIT Systems View

NAVAL AVIATION SYSTEMS

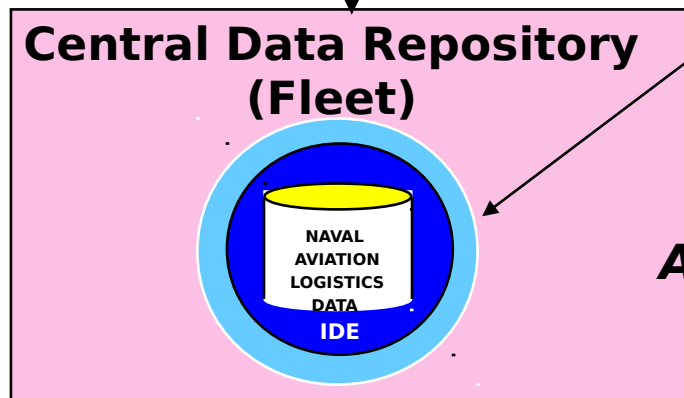
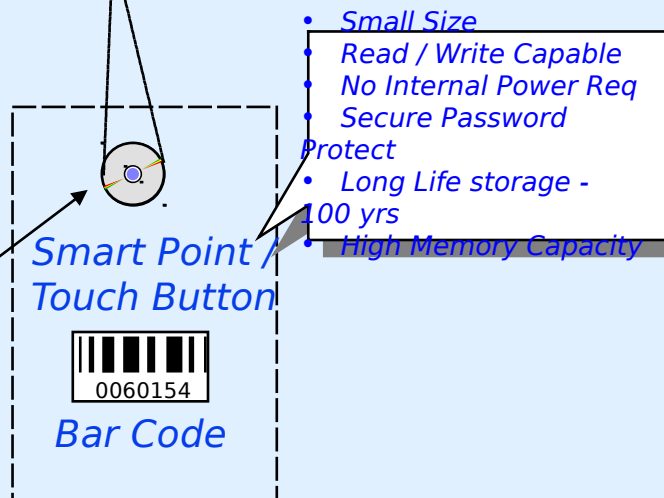
# TEAM



## Retrograde Cycle

Equipment  
(Remove / Replace)

Repair Facility  
(IMA, CLS, etc.)



## Automatic Identification Technology

Bar Code, "Smart Point" & "Touch Button"



# **NALCOMIS Optimized OMA**

*(Naval Aviation Logistics Command Management  
Information System*

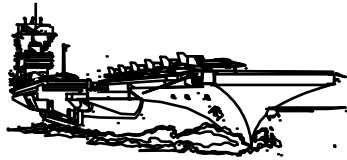
*Organizational Maintenance Activity)*



- **Automated logbooks and configuration management (CM)**
  - Automatically tracks installed location and life usage for any component entered in the baseline, by serial number, enabling better service life management
- **Provision for the use of interactive electronic technical manuals (IETMs) and portable electronic display devices (PEDDs)**
- **Automated forecasting and tracking of maintenance schedules**
- **Support for program unique capabilities (AME)**
- **Data replication technology and networked architecture, providing**
  - Near real time readiness reporting
  - Significantly improved upline data accuracy and timeliness
  - Near real time access to information for spares forecasting, material management, and conditioned based maintenance
- **Tracks technical directive (TD) status for any component entered in the baseline**
- **Eliminates loss of component history data through use of electronic log sets**



# ***OOMA Functional Benefits***



## ***Fleet***

- Tracking Configurations
- Serial Number Tracking
- Automated Log book
- Reduction of Data Collection
- Improved Accuracy in reporting
- Pre-positioning for next generation Aircraft
  - Autonomic Logistics

## ***Uplink***



- Near Real-Time view of Fleet Data (Worldwide)
  - Readiness
  - Flying Hours
  - Maintenance Actions
- Asset Visibility
- Feedback Data
  - Reliability Centered Maintenance
  - FLE Analysis
  - Total Ownership Cost Analysis
- Configuration Centric Management



# NALDA IDE

(Naval Aviation Logistics Data Analysis  
Integrated Data Environment)

NAVAL AVIATION SYSTEMS

## TEAM



### Maintenance / Operations

**Maintenance  
Management**

**Fatigue Life  
Expended**

**Supply**

**Config Status  
Accounting**

**Inventory/  
Custody**

**Flying Ops**

**Readiness**

**Tech Data**

**Support  
Equip**

**Training**

**"O" Level**



**"I" Level**



**Depots**



**Commercial**



### Program / Logistics Management

**OPNAV**

TOC  
Policy  
Readiness  
Flying Hour  
Program



**NAVICP**



WSM  
Fleet Repro curement  
Asset Visibility

**OEMs**



Maintenance Plan  
Source Data Devel

**PMA**

**FST**

**IPT**

RCM  
Tech Data  
Ownership Cost  
Affordable  
Readiness



NAVAL  
AVIATION  
LOGISTICS  
DATA  
&

APPLICATIONS  
INTEGRATED  
DATA  
ENVIRONMENT  
(IDE)  
NETWORK

Readiness **TYCOM**  
Cost  
Deployment preparation  
Configuration Mgmt







# ***Post Fielding Support Analysis***



- Goals
  - Provide a real-world, knowledge management solution for logistics analyses.
  - Provide decision makers with access to the information and skills necessary to
    - share and integrate information across levels,
    - view data from different perspectives,
    - analyze logistics support situations and solve problems.Other goals include the
    - identify trends
- Requirements Gathering
  - Joint: ***Logistics Information Requirements Council and Logistics Information Board***
  - Fleet and OPNAV: ***AMSR Analyst Working Group and Metrics Working Group***
  - NAVAIR: ***In-Service Support Business Process Reengineering Team***



# ***Post Fielding Support Analysis***

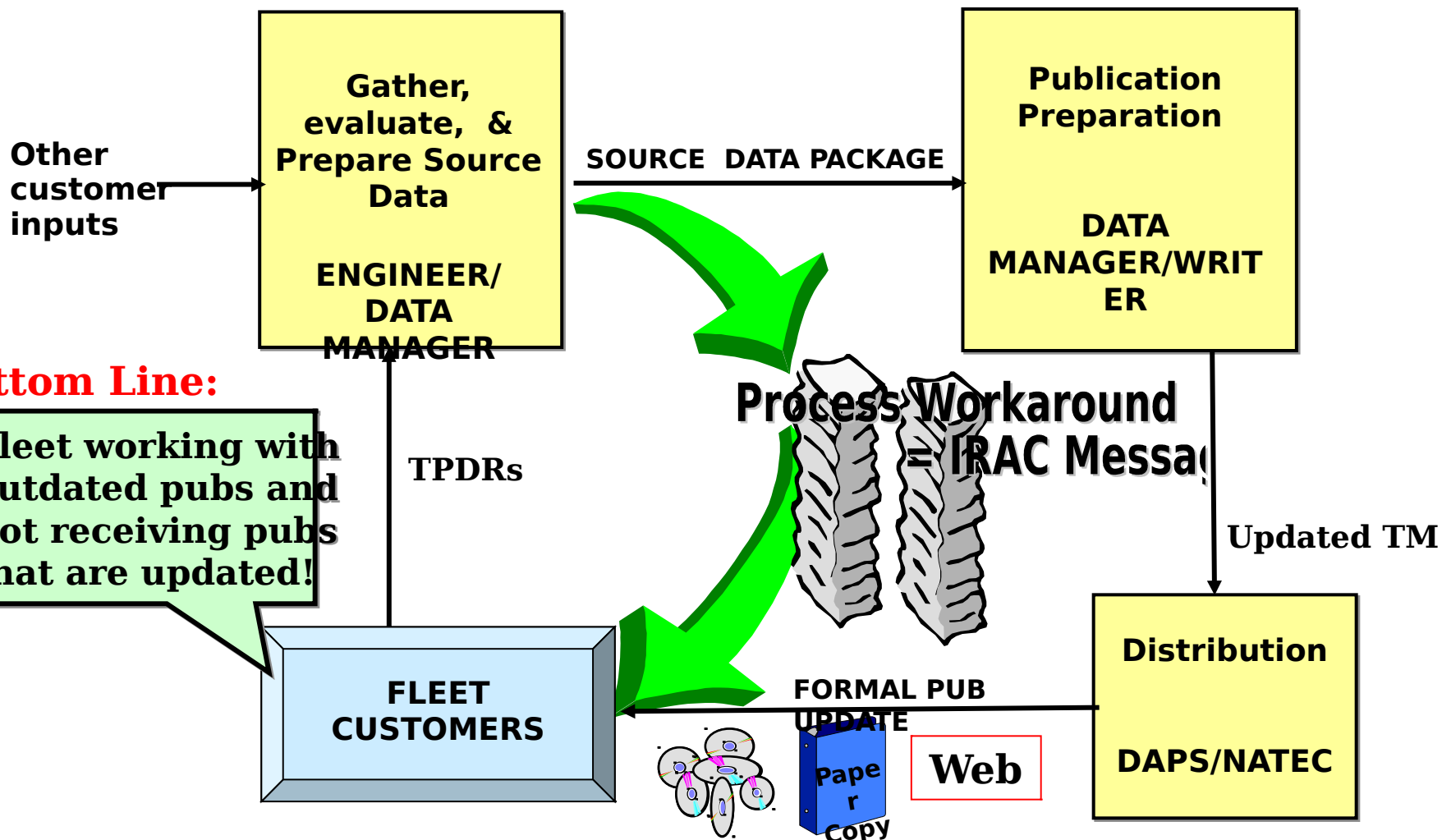


## Methodology:

- Customization
  - WWW Portal to provide gate to a . . .
- Query Environment employing . . .
  - Data Warehousing/Data Marts
  - On Line Analytical Processing Tools (**OLAP**)
- Communities Served . . .
  - Affordability, Supportability, Readiness and more to come . . .
- Currently in final test with E-2C Fleet Support Team, Naval Aviation Depot, North Island, CA



# Publication Update Process





# ***Digitization of Publications: Strategic Planning Initiatives***



- **Documentation of our end-to-end technical manual processes**
- **Definition of supply system processes and documenting agreements between NAVAIR, NATEC, NAVSUP, and DAPS**
- **Definition of processes for Version Control of pubs**
- **Continued development of NATEC web-based Technical Manual Application System (TMAPS) to:**
  - » **Manage Source Data and Cost Estimates**
  - » **Track “Get Well,” digitization, and migration to Sustainment**
  - » **Obtain metrics to report health of publications - IRAC and TPDR metrics already available online**

## **TMAPS VISION**

- **Improved PRL Data call - Backlog and Sustainment to be separately identified**



# CMIS Program Purpose / Background



## Joint Program

- Navy as Executive Agent - ACAT-III Program
- Acquisition Oversight Delegated to DASN (C4I)
- Sponsor - OPNAV N88

## 11 Deployed Systems



1  
ARMY



4 AIR  
FORCE



1 DEPT OF TRANSPORTATION

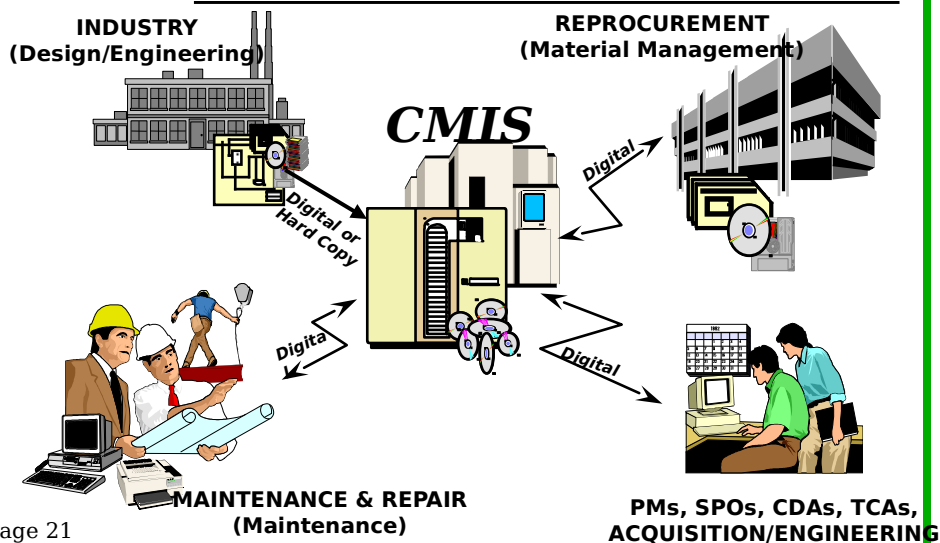


4  
NAVY



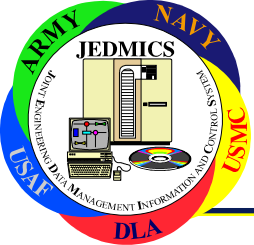
1  
USMC

## Functional Customer Base



## User Metrics

- *Readiness Rates*
- *Depot Repair/Rebuild Time*
- *ALT / PLT (Inventory Carry Cost)*
- *RTAT (Repair Turnaround Time)*



# JEDMICS Program Purpose / Background

NAVAL AVIATION SYSTEMS

## TEAM



### Joint Program: ACAT 1AC

- Providing Standard Engineering Data Repository System
- Navy as Executive Agent
- Sponsor: N43
- Acquisition Oversight Delegated to DASN (C4I)
- Savings Investment Ratio 6.2 (1997)

### Customers

#### 29 Operational Sites



ARMY

36,000 User  
Accounts Across  
600 Sites



NAVY



DLA

77 Million Images  
Managed



AIR FORCE

2 Million Images  
Retrieved Per  
Month



USMC

### Functional Customer

#### Base

INDUSTRY  
(Design/Engineering)

REPROCUREMENT  
(Material Management)

**JEDMICS**

Digital or  
Hard Copy

Digital

Digital

Digital

REPOSITORY OPERATIONS

MAINTENANCE & REPAIR  
(Maintenance)

PMS, SPOs, CDAs, TCAs,  
ACQUISITION/ENGINEERING

### Service Statistics

	<u>Images Retrieved/Mo.</u>	<u>User Images Loaded</u>	<u>Images Accts.</u>
Air Force	17,255,204	12,618	
Navy	43,494,421	11,129	
DLA	7,424,588	2,679	375,787
Army	10,349,295	8,186	

903,681

617,760

219,326



# JATDI Program Purpose / Background

NAVAL AVIATION SYSTEMS



## Joint Program:

- **The JATDI requirement:** Create a Technical Data Integrated Environment Whereby Digital Technical Data, Training, and Maintenance Expertise Is More Available and Accurate, As Knowledge for the Warfighter, by a Cheaper, Faster Means.
- **Approval Auth:** JACG
- **Sponsor:** N78

## Current Customer Base



ARMY

H-60



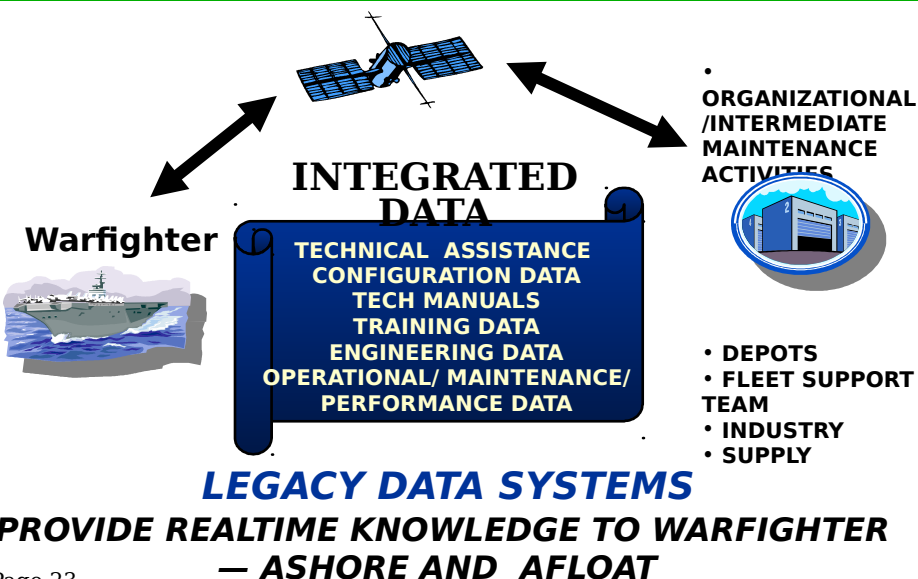
NAVY

H-60  
EA-6B



USMC

EA-6B



## JATDI FY01 Joint Focus

- Joint Web-Application Expansions
  - C-130
  - JAHUMS Data integration
- FMS Support
- Continue H-60 Support
- OH-58, AV-8B, AH-64, CH-47, T700, J52
- Document Conversions
- Deployment to Army & Air Force Squadrons
- Expansion of DLA E-mail Interfaces





# JCALs Program

## Purpose / Background

### Joint Program:

- The JCALs program provides for a common, integrated infrastructure for organizing data about weapon systems over their entire life-cycles. The system provides applications and services to implement joint functional processes.
- Army as Executive Agent
- Requirements Sponsor: N4

### 67 Deployed Sites

As of January 16, 2001



**ARMY**  
15 Sites



**NAVY**  
32 Sites

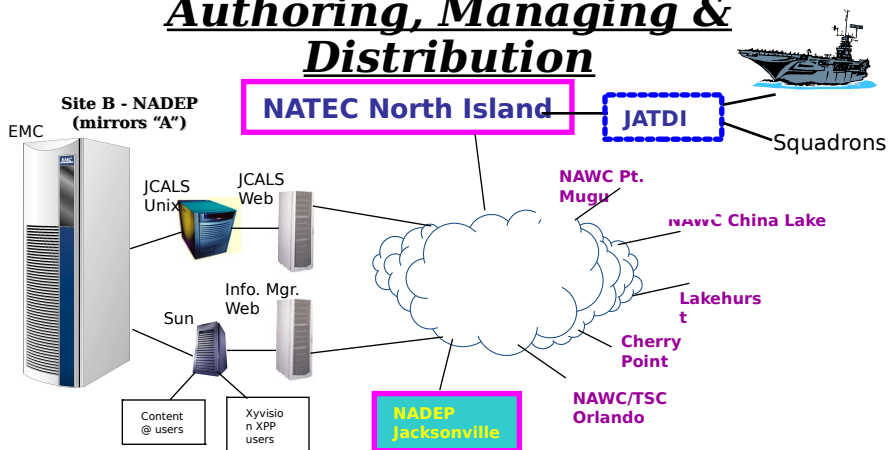


**AIR FORCE**  
18 Sites



**USMC**  
2 Sites

### Proposed NAVAIR TM Authoring, Managing & Distribution



### Navy JCALs Continuity of Operations Plan

- Establish Centralized Primary Storage Platform (EMC)
  - Single Source of Navy Managed Info
  - Protect Corporate Information
    - JCALs Data
      - TM's , EOSS, PM,
      - SGML/XML/PDF
    - JEDMICS Data
- Replicate Data between three sites
  - NAVSEA Philadelphia, NSWC-PHD, NADEP N.I.
- Enable Disaster Recovery & Mission Continuation Plan
  - Storage Area Network Facilitates Disaster Recovery

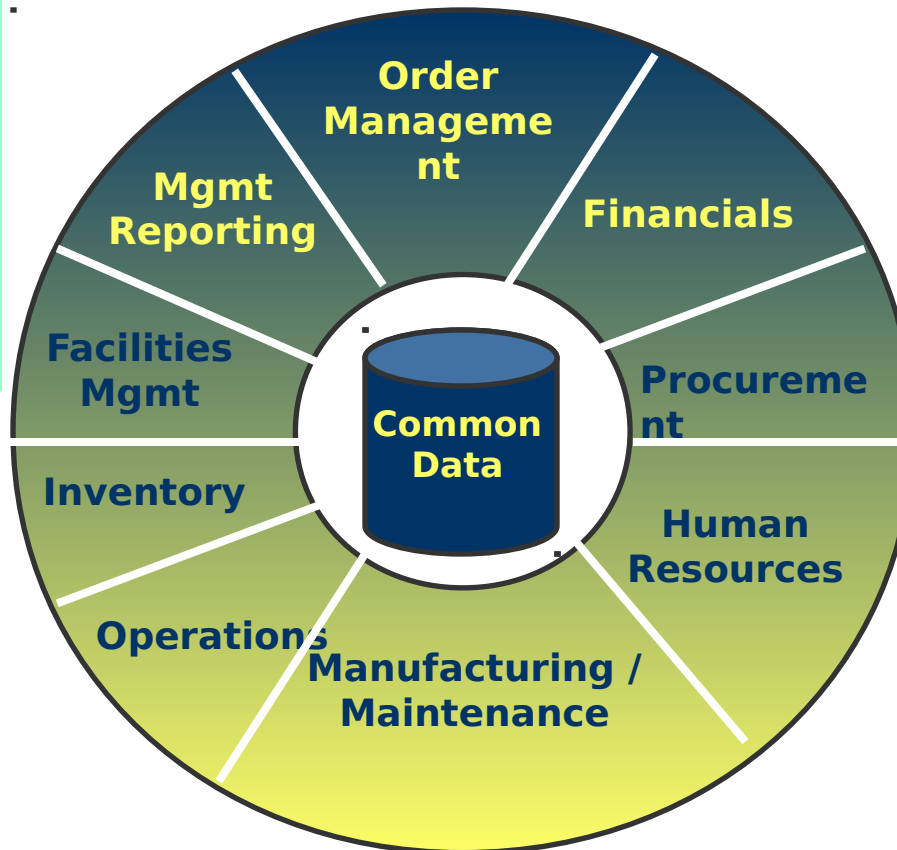




# ***What is Enterprise Resource Planning (ERP)?***



**Revolutionary change in business processes for dramatic improvements**

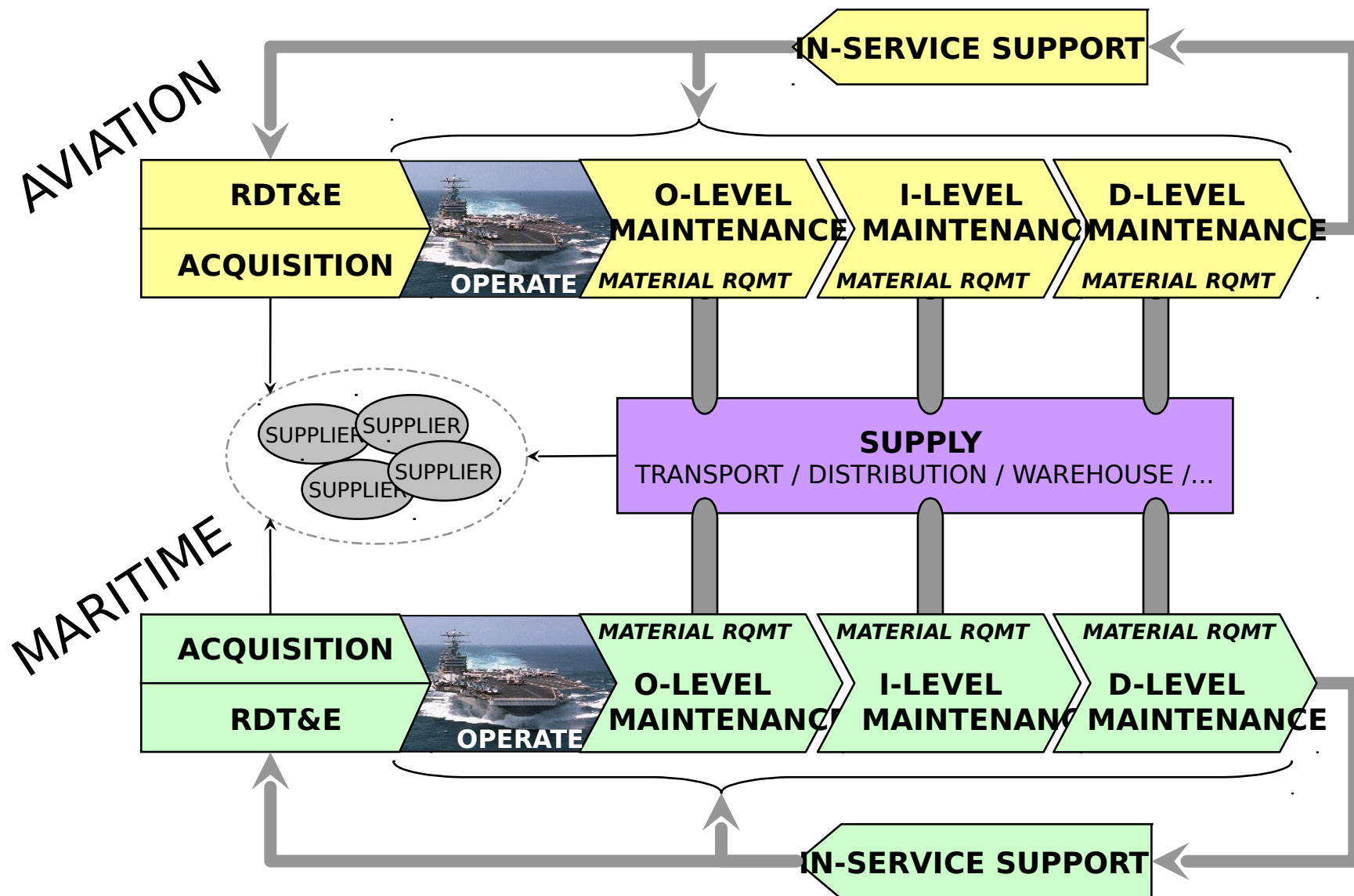


**Integration of business processes to optimize functions across enterprise (e.g., supply chain, finance, manufacturing/maintenance, HR)**



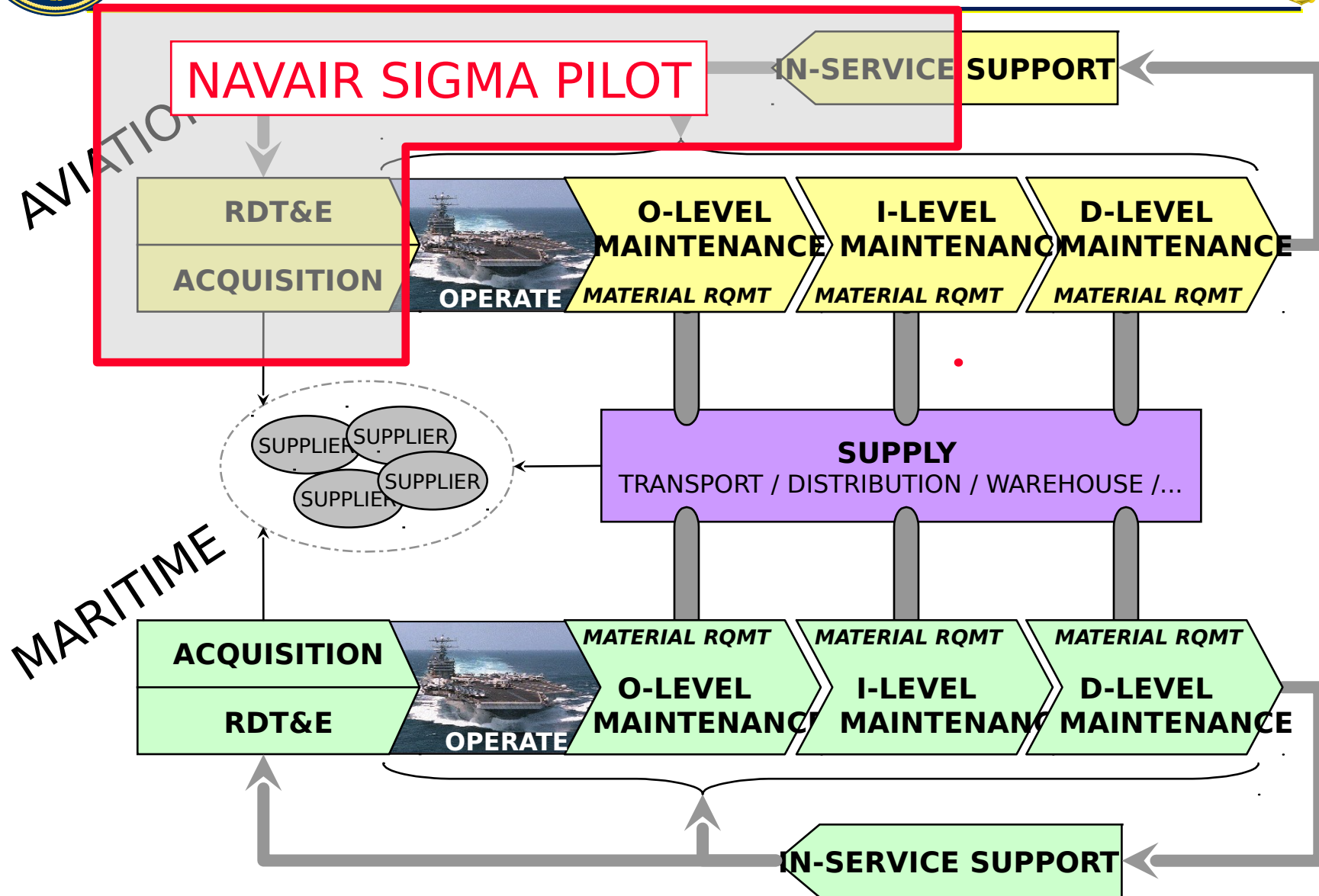
# Naval Aviation & Maritime Value Chain

NAVAL AVIATION SYSTEMS



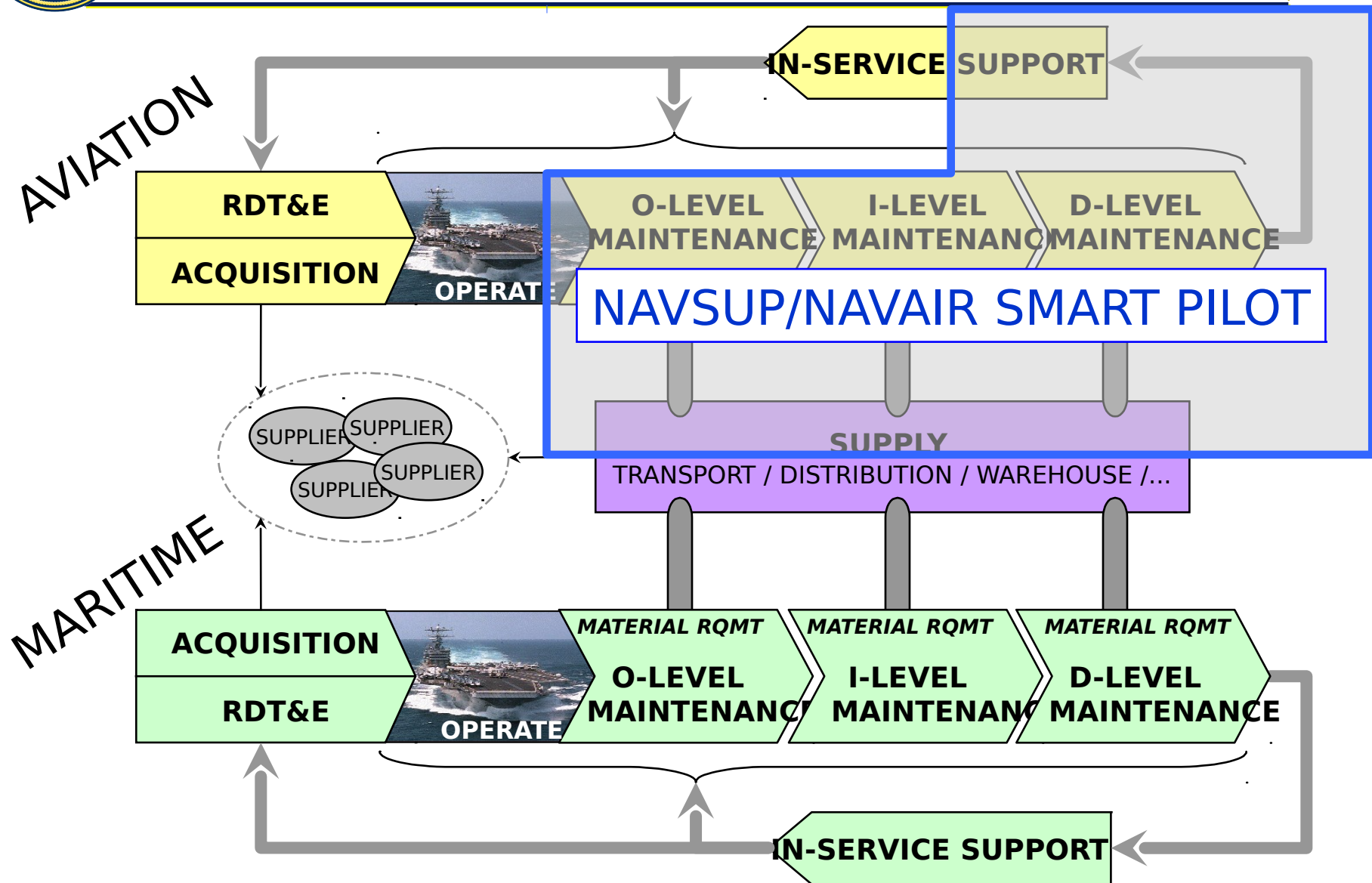


# NAVAIR ERP Pilot Scope



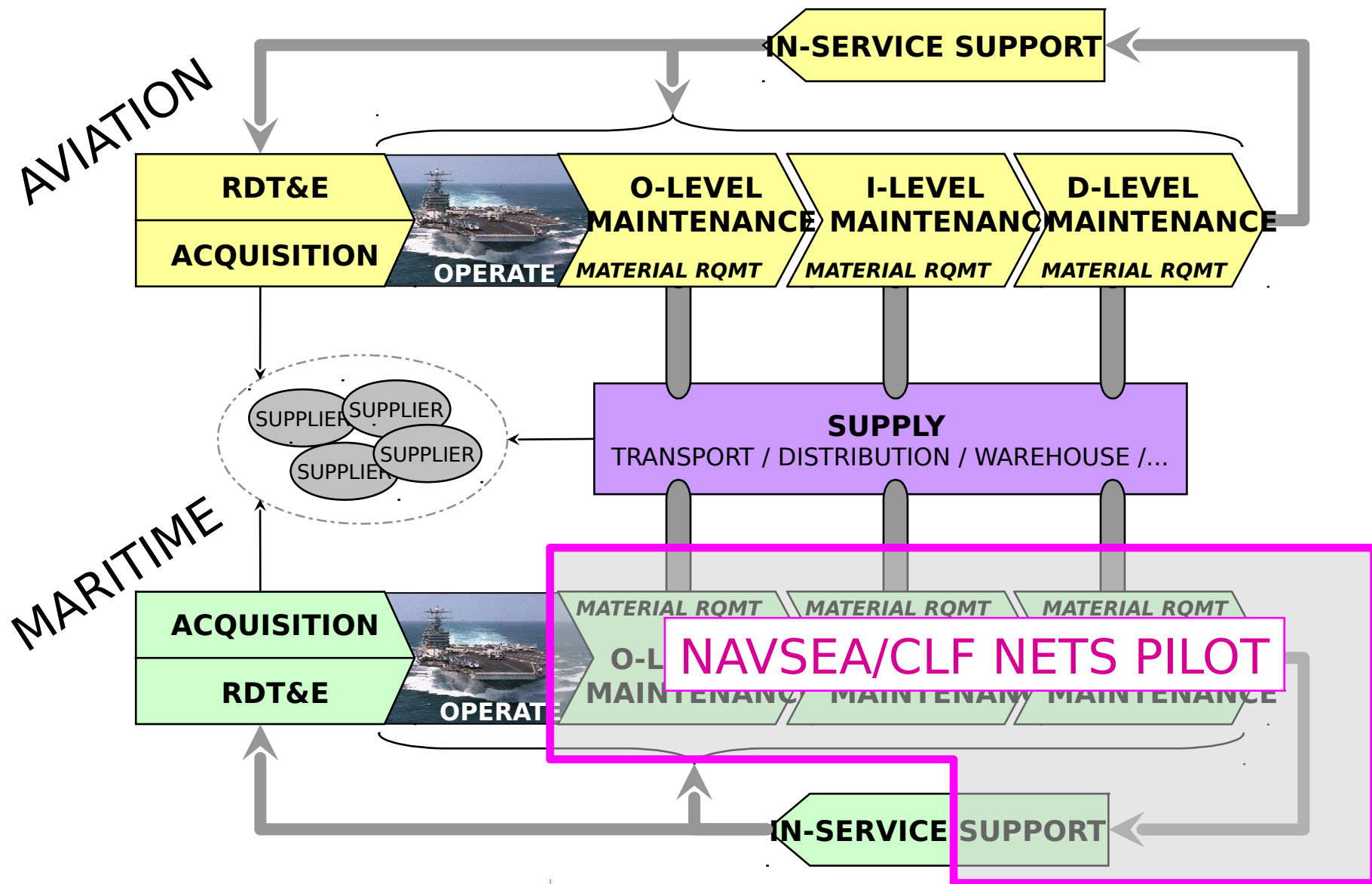


# NAVSUP/NAVAIR ERP Pilot Scope





# NAVSEA/CLF ERP Pilot Scope







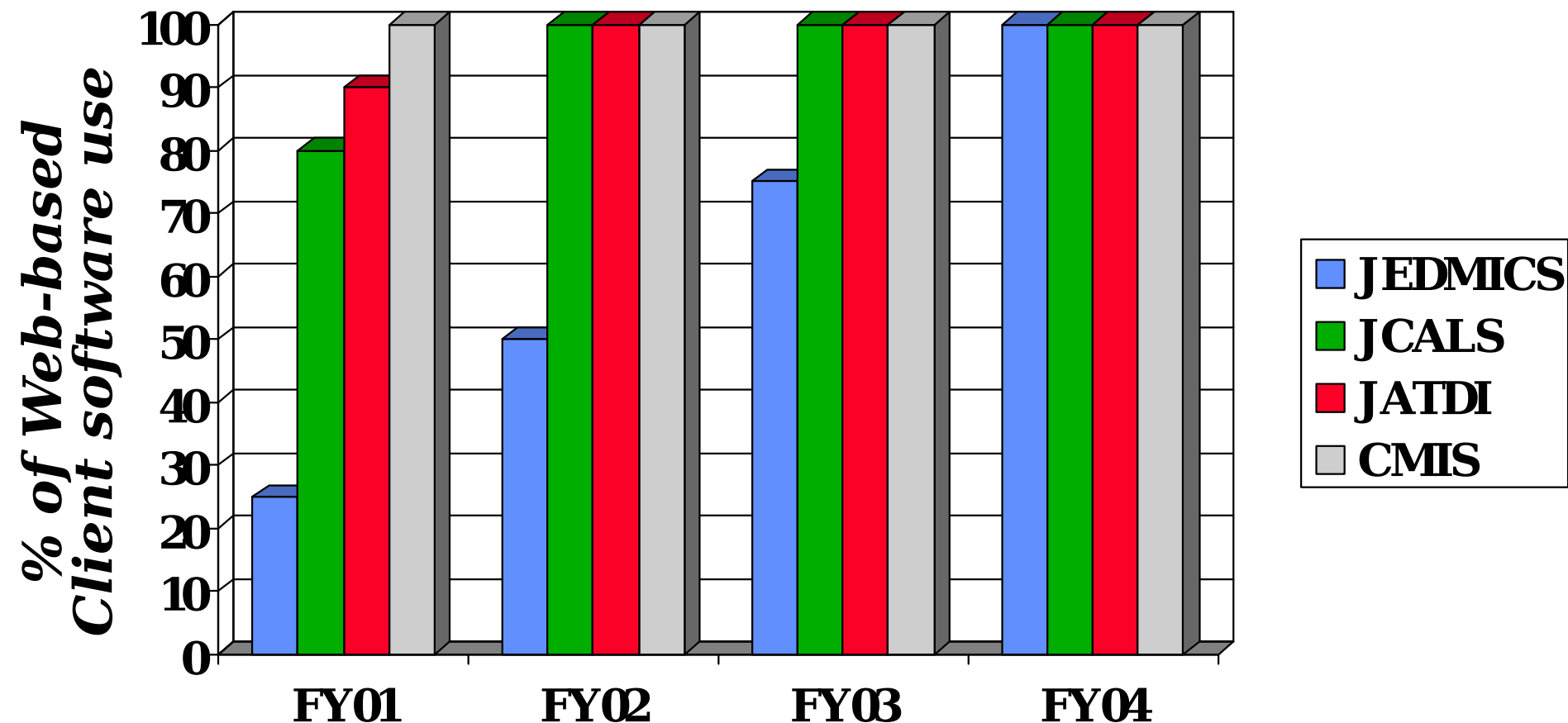
# ***ERP Opportunity***

- ERP appears to meet most goals of JV2010 Information Fusion
  - Common application views of data across command & function lines
  - ELVIS view of assets
    - commercial & organic repair cycles
    - storage & transportation systems
- ERP is a DON change agent through shared vision, process change, and data integration
- Modern, commercially-available analysis & forecasting tools to provide “Smarter” investment of funds and reduction in inventories

Common Vision / Common Processes / Shared Data



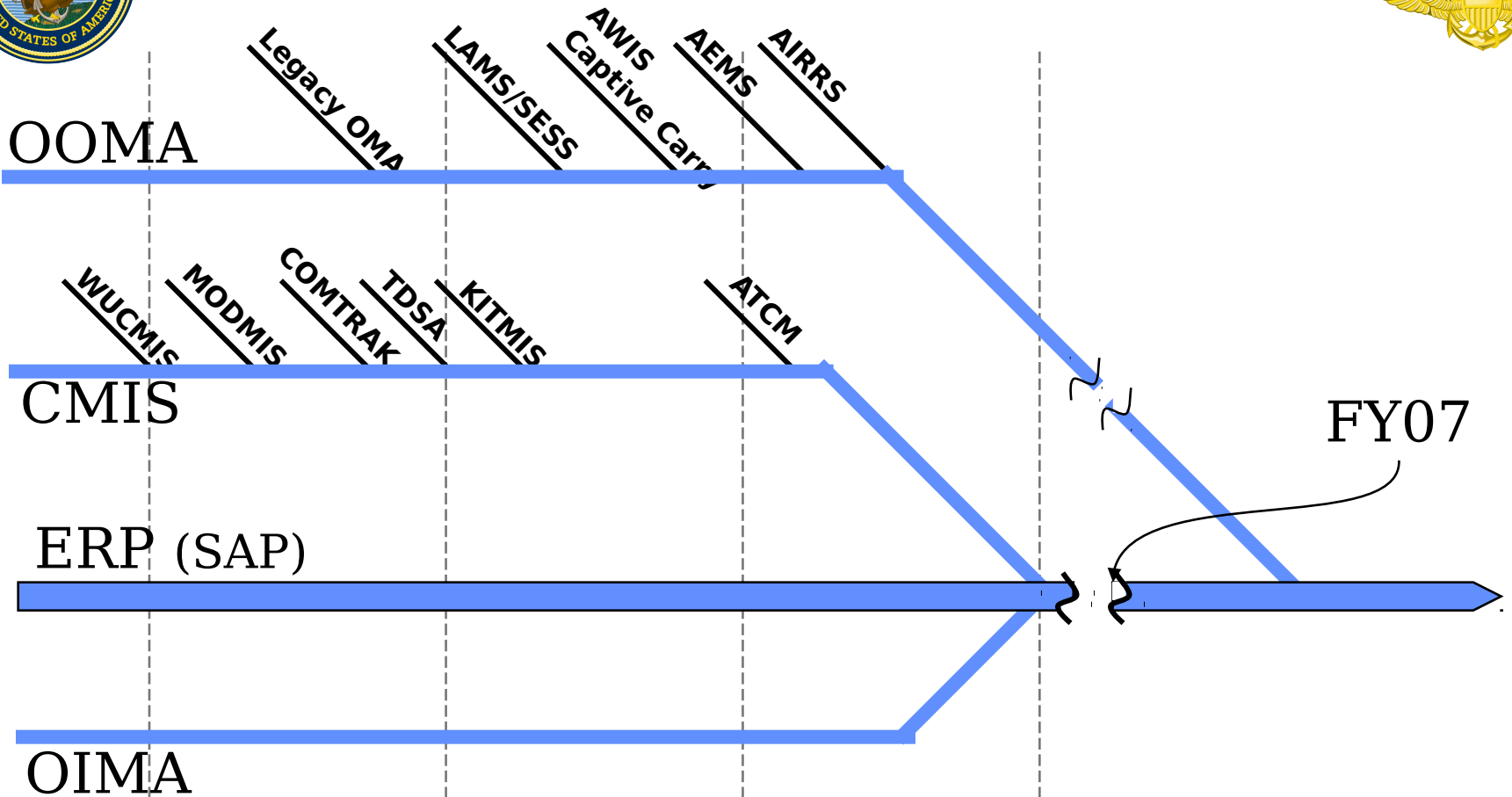
# ***Joint Program Web Progress***





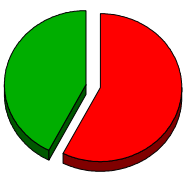


# Web Enabling Applications & Data



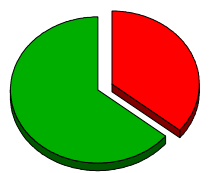
FY07

FY01



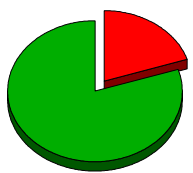
43% / 57%

FY02



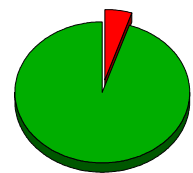
64% / 36%

FY03



80% / 20%

FY04



95% / 5%

% of Users accessing Web Enabled software



# Summary



- **Using GCSS / NMCI as 'Backbone'**
- **Consolidating to 3 primary Input Systems**  
(Web-enabled by end of FY04)
  - ↳ NTCSS - OOMA
  - ↳ CMIS
  - ↳ Navy ERP
- **Using JEDMICS / JATDI for Tech Data storage and delivery**
- **Using NAVAIR Corporate / Navy Portal as 'Face to the Fleet'**



# ***Follow-up?***



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# ***Cautionary Note***



- **“There is no ‘Silver Bullet’ . . .**
- **There is no ‘Happy Place’ . . .**
- **There is no ‘One System’ for all services”**

***– LTG Gary McKissock, USMC  
DCS Installations and Logistics, USMC***

(DOD Logistics Community Conference Annapolis, MD, August, 2000)

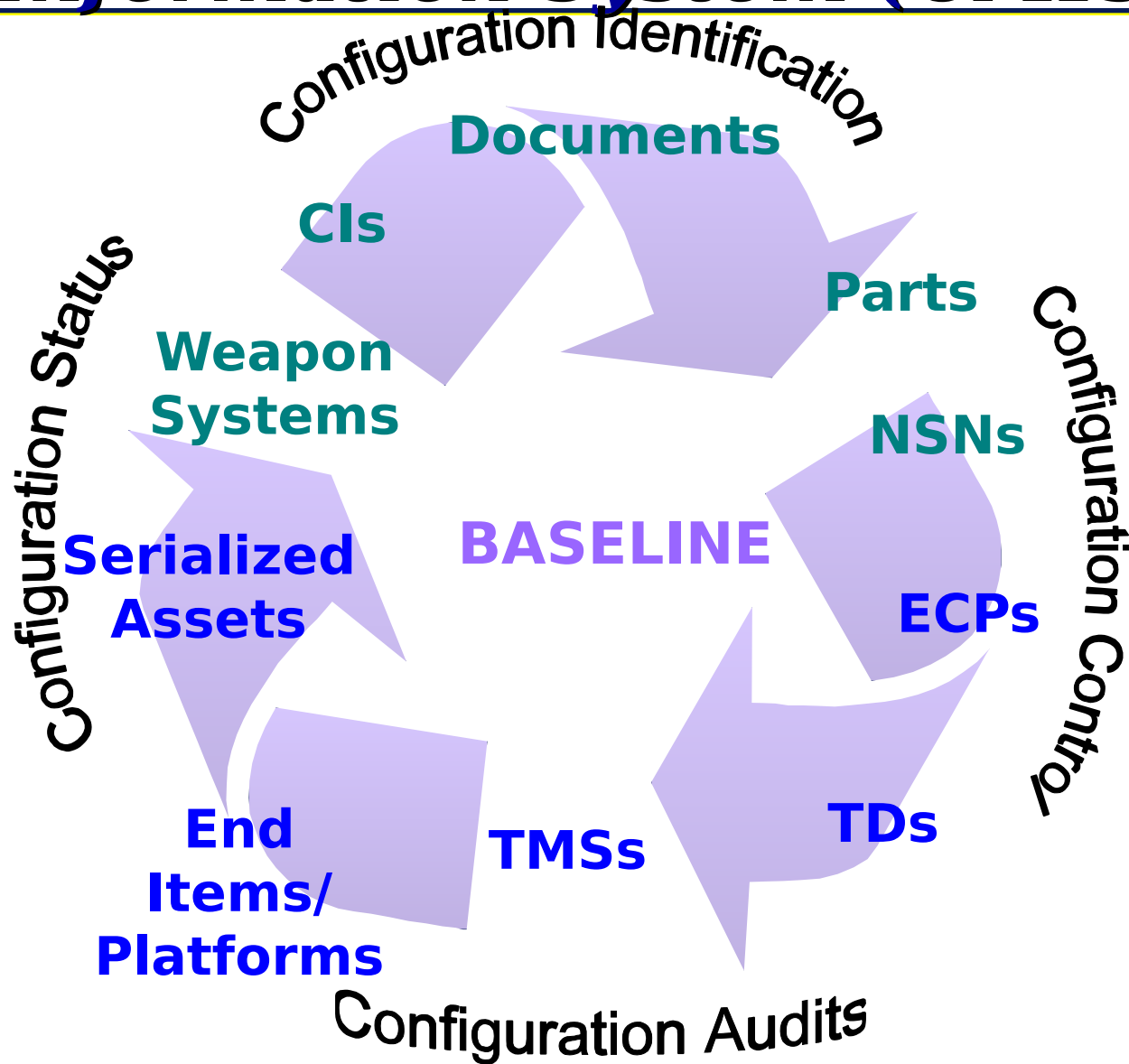


***Backup***



# ***Configuration Management Information System (CMIS)***

NAVAL AVIATION SYSTEMS





# ***CMIS Functions***



## **Configuration Identification**

- Manages configuration baselines
- Provides hierarchical view
- Documents key relationships between engineering drawing, part number, NIIN & Work Unit Code (WUC)
- Interfaces with Standard engineering drawing repository (JEDMICS)
- Supports sharing common baseline data with NALCOMIS Optimized OMA (OOMA)

## • **Configuration Control**

- Supports the complete Engineering Change Proposal (ECP) process from development of proposal to Configuration Control Board action
- Manages the proposal, justifications, evaluations and coordination of ECPs, Requests for Waiver/Deviation and their related documentation
- Maintains historical records



# ***CMIS Functions***



- **Configuration Audit**
  - Records status and certification results of Functional Configuration Audits (FCA) & Physical Configuration Audits (PCA)
  - Tracks status of FCA and PCA deficiencies
- **Configuration Status Accounting**
  - Records and Reports
    - Actual configuration of Fleet assets by Part Number and Serial Number
    - Technical directive incorporation status
  - Able to support future interfaces
    - NALCOMIS and Depot AIS's to update CMIS as changes occur
    - Track transfer of asset data between fleet OOMA sites
  - Facilitates Total Asset Visibility and Serial Number Tracking
  - Maintains historical records





# ***Joint Aviation Technical Data Integration (JATDI)***

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- Global Knowledge Access
  - Icon on a desktop
  - Technical data conversion
  - Readiness analysis data
- Technical Knowledge On Demand
  - Technical Maintenance Camera System (TECHCAM)
  - Training Video on Demand
- Technical Data Access
  - Technical Manual Server
  - Automated Life Support System
  - Integration with CMIS and JEDMICS
- USS LINCOLN prototype



# ***NAVAIR Capability***

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## **NAVAIR'S JATDI experience lends itself to play a key role in the development of Task Force Web (TFW)**

- JATDI chartered by the Joint Aviation Commander's Group to demonstrate a web-based solution for providing digital data to shore-based and deployed weapon system maintainers.
- NAVAIR as the lead for JATDI has a centralized staff and 21 contractor support personnel already experienced in TFW objectives.
- JATDI's web-application and deployment server fielded over 19 months ago.
- 2 year's experience of evaluating COTS products and operating a centralized web-server operations center.



# ***NAVAIR Capability (Cont'd)***

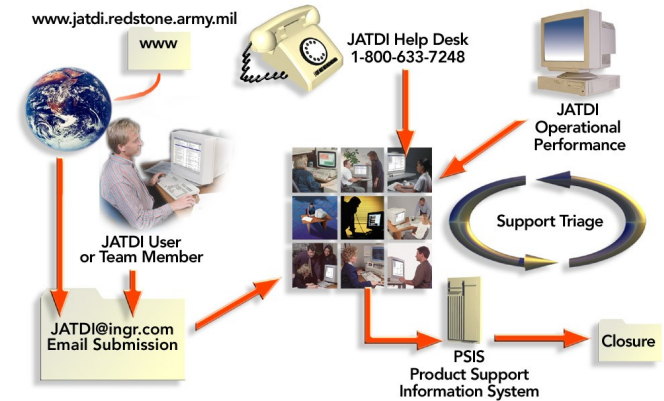
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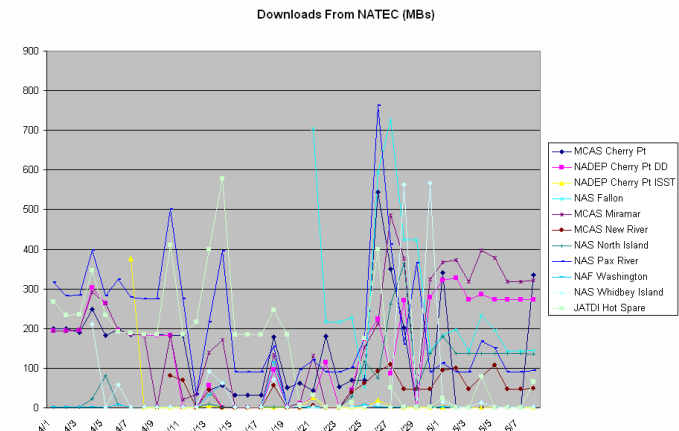
- Web security experience.
  - ✓ Utilizes 128bit encryption software
  - ✓ Tested the ability to implement PKI when DoD implements.
  - ✓ Currently working to demonstrate creation of a Virtual Private Network (VPN) with encryption between servers.
- Using COTS products, JATDI indexed all datasource locations and implemented a strong search capability (similar to Yahoo).
- JATDI has over 4,000 registered users for two weapon systems - H-60 and EA-6B.
  - World-wide web capability for the H-60 and EA-6B
  - Deployed on the USS Lincoln and the BG Aviation Squadrons
  - Currently training all USS Roosevelt Aviation Squadrons for deployment in September.
  - This year the USS Washington has also been scheduled for deployment.
  - JATDI is scheduled to expand the web capability to all

# NAVAIR Capability (Cont'd)

- JATDI is Sustainable
  - JATDI Help-Desk Procedures Established
  - Pro-Active Support Procedures Utilized



- JATDI Metrics Available
  - Sustained and peak bandwidth monitored and reported





# ***NAVAIR Capability JATDI Summary***



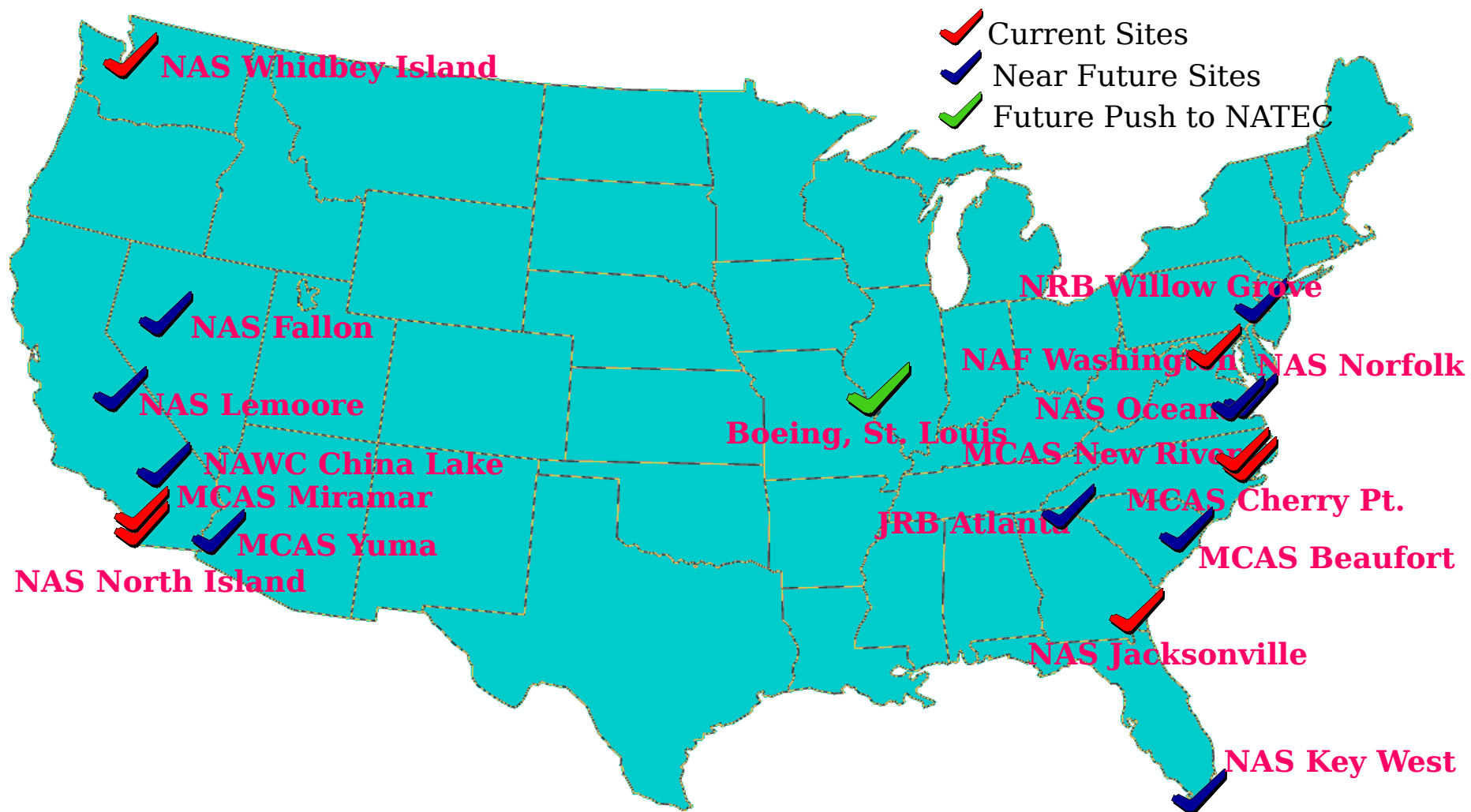
- JATDI is Open Architected
  - Designed & built upon a standards-based architecture
  - Scalable and poised for growth in support of additional weapons systems
  - Modular, robust interface standards allows one module to change without affecting others-
  - Integration Infrastructure (II) provided for external data sources and applications
  - Redundant HW and SW design maximizes Up-Time
- JATDI is Deployed
  - Currently supports multiple joint weapons systems
  - Data caching / distribution infrastructure established
  - Afloat and ashore networks supported including non-connected state
  - Poised to support additional joint weapons systems



# Current Status of JATDI TM Server Sites

NAVAL AVIATION SYSTEMS

**TEAM**





# Current Status of JATDI TM Server Sites

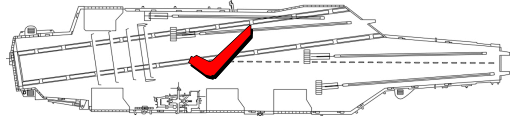
NAVAL AVIATION SYSTEMS

# TEAM

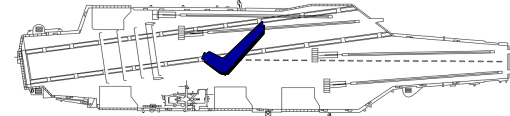


- ✓ Current Sites
- ✓ Near Future Sites

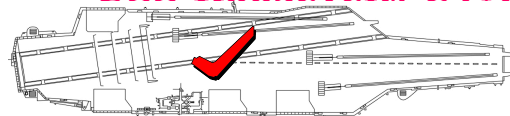
**USS Lincoln, CVN-72**



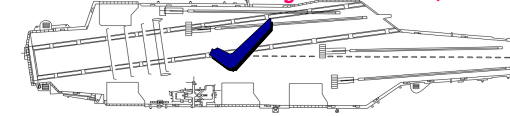
**USS Truman, CVN-75**



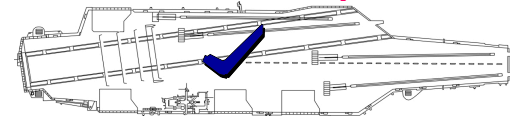
**USS Roosevelt, CVN-71**



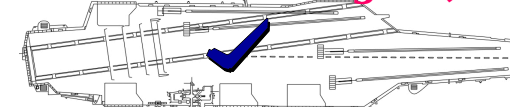
**USS Kitty Hawk, CV-63**



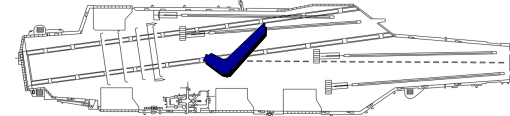
**USS Vinson, CVN-70**



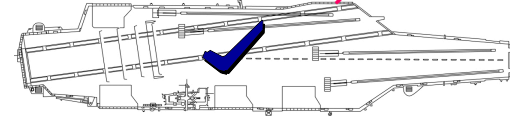
**USS Washington, CVN-73**



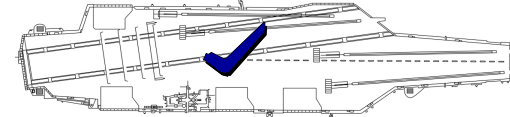
**USS Stennis, CVN-74**



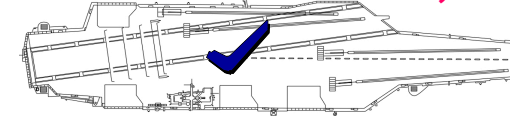
**USS Nimitz, CVN-68**



**USS Kennedy, CV-66**



**USS Eisenhower, CVN-69**







# ***Publication Conversion***

## **Technical Manuals (TMs)**

- **New manuals - prepare in XML IAW MIL-STD-3001**
- **TM Updates - convert to *editable* formats (e.g., MS Word, Interleaf, etc.)**
- **Other TMs - scanning to PDF**
- **AIR-3.3 preparing guidance for publishing of foldouts (e.g., schematics) as separate paper supplements**

## **Engineering Drawings**

- **Native file formats delivered for maintenance by FSTs when required by the Program Offices**
- **CALS Type 4 files required for IEDMICS load**